

## SPINAL IRRITATION.\*

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IT is no part of my intention in this brief paper to enter upon a history of the literature of this disorder, beginning, as it does, in various more or less vague descriptions in the works of older writers, and from them advancing down to the present rather abundant, but seldom practically valuable literature.

My intent is rather to give the results of a rather prolonged experience with and study of this disorder.

Several classes of affections have been confounded together in descriptions of spinal irritation.

In the first place, various diseases of the vertebral column itself, such as spondylitis, more especially its subacute and chronic non-suppurative forms, with or without enlargement or deformity. Then, again, it would appear, in some instances, to have included disease of the muscles themselves, or of the abundant ligamentous tissue of the spinal column, such as myalgias, rheumatic irritation of the external fibrous and muscular structures of the spinal column, chronic syphilitic affections, attended with pain and soreness, affecting the periosteum of the vertebræ, and chronic affections of the dura, more particularly subacute congestions and inflammatory affections of this membrane, attended with local

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pain and tenderness ; also recent subacute affections of the sensitive tract of the spinal cord. These disorders, not to mention those of so-called hysterical origin, have either one or all been by various writers included under the term spinal irritation.

Setting these various classes of affections to one side, and directing attention to the spinal cord itself, we find wide diversities in opinion as regards the nature or pathology of the disorder in question.

It has been considered as due to congestion, or, on the other hand, as due to anæmia even of limited tracts of the cord, such as its posterior columns ; or in other cases no positive opinions have been emitted as to the nature of the affection, the task of working out a pathology having been resigned as impracticable in the present condition of our knowledge.

It will be impossible, in the time and space to which I have limited myself in this paper, to discuss all these questions. I shall, therefore, as already intimated, content myself with a statement of the views I have finally adopted as to the nature and treatment of spinal irritation. I will begin, therefore, by citing its more prominent characteristics. Thus, in the first place, pure spinal irritation includes exaltation of the pain-sense, in the nerves which enter the horizons of the spinal cord, which are the real seats of the affection. As a rule, except for short periods in time, there are no paræsthesias, such as numbness, tingling, prickling, and other similar morbid subjective sensations, in the sphere of distribution of the nerves in question. As a rule, marked anæsthesia of the tact-sense is not present. But there is a true hyperalgesia, or exaltation of the pain-sense, which is the more marked as the sensitive nerve trunks involved are shorter. In other words, the nerve twigs which supply the skin over the spinal column itself are known, of course, to

be shorter than those which proceed from the front of the body or from the limbs. The longer the nerve trunk the less irritable it seems to be; the shorter its course is before it terminates in the gray matter of the spinal cord the more irritable it seems to be. Hence, the chief external seat of morbid nerve sensibility is, as might have been expected (in view of the apparent fact just stated), greatest over the spinal column itself.

In the second place, the augmentation of pain sensibility, which belongs to spinal irritation, is more marked, as a rule, in response to a slight touch than to a heavier touch, especially if the latter is made gradually. The morbid sensibility, therefore, which belongs to spinal irritation is not of the same nature as that which belongs to the inflammatory soreness, which, as a rule, is more painful as the pressure is more firm or forcible.

Then, again, in spinal irritation there is no regular increase of temperature, or disturbance of the circulation, or swelling either in or beneath the skin of the morbidly sensitive region, that can be determined by the most careful examination. Then, true spinal irritation can seldom be traced, with certainty, to physical injury of the spinal column. Then, again, reflex excitability of the affected zones of the cord is seldom diminished, but much more frequently than otherwise increased.

Spinal irritation seldom or never includes paralysis either of sensibility or motion, in uncomplicated cases, either in the parts which receive their nerves from the affected zones of the cord, or from parts which are below or behind them.

Spinal irritation seldom ever affects in any given case the entire length of the spinal cord, but, as a rule, only certain horizons or zones of the same, especially the lumbar, brachial, and cervical zones. It usually occurs in persons having a

nervous temperament and presenting more or less marked symptoms of nerve exhaustion.

The pain of spinal irritation, though frequently spontaneous, is nearly always a *fatigue* pain, or one which the patient describes as being a "tired pain," which is relieved, in a measure, by rest in an easy posture, made worse by exercise, and though aggravated by movements or motions, is not to the same extent so as in cases of disease of the spinal column or of the dura.

These latter disorders are, as a rule, clearly localized and present a variety of symptoms, some of which, more or less, agree with those of spinal irritation, but others offer a wide difference, sufficient to enable the careful observer to distinguish between them, or, at least, to enable him to determine the presence, in complicated cases, not only of true spinal irritation, but of the other disorders with which it is so often confounded.

Without undertaking at present to state all the reasons in view of which I have arrived at my conclusions as to the intimate nature of spinal irritation, I will state them briefly. In every case of true spinal irritation the chief seat of disease is in the spinal cord, in its sensitive tract. It includes, first of all, a nutritive lesion in which, to use a favorite phrase of mine, there is a more or less marked loss of balance between waste and repair, the former having out-run the latter. In my view of the case there is positive leanness, or substantial interstitial loss of the ultimate nerve elements. It is believed that, as in the case of the wasted muscle, or like leanness or loss of volume and weight in any given part, or even of the whole body, accompanied by a corresponding loss of energy or power, the same condition occurs in the exceedingly active and frequently overworked nerve mechanisms, especially those of the spinal cord. It is true these things have not been made

the subjects of ocular demonstration, but the course of reasoning is so direct and cogent, based upon well-known facts ascertained by observation in relation to more accessible parts of the body, as to compel the acknowledgment of the position taken as substantially correct. Any part of the spinal cord which is habitually over-excited or over-worked, and the consequent wear of which has gone on faster than the reparative work of nutrition for the same part, sooner or later may suffer not only a loss in volume and in power, but the process of wear and tear, when it has advanced to an extreme degree, even in a muscle, gives rise to irritation, the expression of which is at first a mere feeling of fatigue, but if the process of wear is carried farther, fatigue graduates into pain.

If repair of the nerve waste out of which these symptoms arise is accomplished by rest and nourishment, not only the pain but the fatigue disappear. But if the degree of waste is great, and if the circumstances of the case are such as to retard or prevent the process of repair from being carried forward, so that the part in question remains, as regards its nutrition, constantly in that state which gives rise to fatigue and pain, then these latter symptoms, like the lesion of nutrition, of which they are the common signs, become permanent, more especially if the seat of lesion is in the æsthesodic or sensitive tract of the central nervous system.

In spinal irritation, therefore, the first thing to be recognized is the lesion of nutrition just described, in which there is a more or less permanent and marked preponderance of waste over repair, the process of destruction or waste having been carried to such a degree as to threaten the integrity of the parts, the inarticulate protest against the farther progress of wear being the constant fatigue pain which marks uncomplicated cases of spinal irritation.

With this view, so far as I am aware, do all the phenomena of spinal irritation agree. Rest, the moderate, judicious use of anodynes, tonics, good feeding, include the methods most approved by experience. Nothing is better known than that persons affected with spinal irritation are often in a chronic manner fatigued, in some instances bed-ridden. Nothing is better known about such cases than that exercise, unless of the most moderate character, aggravates the spinal pain and exhaustion.

Having got firmly in view the nature and the immediate relations of the lesion of nutrition just described, I would next call attention to the circulatory disorders which, it seems probable, follow in the wake and occur in the place of the lesion of nutrition described. For my own part, I am clearly of the opinion that within the areas of exhaustion and irritation in the spinal cord there is a fluctuating blood circulation. It may be normal, or there may be a congestion, or there may be anæmia. But this latter condition I conceive to be a rare occurrence and by no means a necessary factor in spinal irritation. Spinal irritation is, therefore, not due to either congestion or anæmia, whether in the posterior columns or other parts of the cord. But I can readily understand that departures from the normal state of blood circulation in the disordered areas are generally toward congestion. Both congestion and anæmia are mere incidents in the course of the disorder under discussion. The fundamental factor is the lesion of nutrition already described. It is important to admit this, not only because it agrees with all the facts, but once fully understood, it points imperatively to the path of recovery, which happily harmonizes in every particular with the results of experience.

Having said thus much concerning the symptoms and nature of spinal irritation, I would next direct attention to

its chief clinical varieties. If what has been said is true of the nature and pathology of the disorder, we may, *a priori*, designate certain altitudes of the cord which would be more likely than others to be the seats of the disease. I would point out two great classes of cases: First, those due to *over-action*, chiefly muscular in character. Second, those cases due to *over-excitation*, or in which the spinal cord is not disturbed on account of its share in the production of muscular activity, but rather on account of the excitations that play into it from different regions to be later specified.

I. Then, first of all, those cases which depend upon *over-action*. The altitudes of the cord most likely to be affected in this way are the lumbar; that is, the altitude corresponding to the lower members, or to the levels of central implantation of the sacral and lumbar plexuses of nerves. Second, the brachial zone of the cord, which corresponds to the upper members in the same manner as does the lumbar to the lower members; and, finally, the sub-occipital zone, including the muscles by which more particularly the upper part of the cervical region of the spine is maintained erect and the head balanced upon the spinal column. I am not able of course to speak for others, but in my own experience I have found a large number of cases of spinal irritation to be due to over-use of the legs in standing, walking, and in other occupations in which they are strenuously or persistently used for long periods in time; or at other times due to over-use of the arms, as in sewing, embroidery, painting, piano practice, and in hundreds of other occupations, in which the upper members are habitually over-used; or, finally, the same condition is seen in cases, where the head is bent forward so as to put the muscles of the neck in a state of all but unremitting tension. The conditions of action described imply, of course, a constant tide of innervation to the related muscles, and this again

implies continuous fatiguing activity on the part of the spinal cord; and at last the decisive irritation of extreme denutrition of those tracts of the cord which are entered by the motor and sensitive nerves of the muscles can hardly be mistaken, when I say that these three great zones of the cord are brought with exceeding frequency, into that worn, fatigued, painful state which is called spinal irritation. How over-use of the cord, especially in persons of nervous and feeble constitution, in whose cases nutrition or reparative power is not vigorous, may produce the lesion of nutrition already described, does not seem to me difficult to understand.

II. I would next call attention to that exceedingly important and, thus far, not very well-defined group of cases which depend upon *over-excitation*. The horizons of the cord which may be the seats of irritation in this group of cases are almost unlimited. In this paper it will be practically impossible to describe all the particular forms met with in clinical experience. I may, however, call attention first of all to two principal levels of the cord which are frequently the seats of "spinal irritation." They are the pelvic and gastric zones of the cord. In this class of cases the supposition is, that some peripheral organ is the seat of irritative disease. It is supposed that the sensory nerves which ramify in the diseased organ are, like its other structures, involved. It is farther supposed that, so long as the irritative disease exists in the organ, a more or less continuous tide of irritative "influence" is directed by way of its nerves into the corresponding altitudes of the spinal cord.

Night and day, whether asleep or awake, an irritative influence enters the cord and contributes to the exhaustion and irritation of its related mechanisms. In this way it comes to pass that inflammatory or other irritative dis-



eases, let us suppose, of the uterus, its fundus or its neck, or disease of the ovaries, or of the rectum, or bladder, or, in the male, its prostatic zone or the urethra, lead sooner or later, if persistent, to exhaustion and irritation of corresponding horizons of the cord. Hence the all but uniform tenderness, exhaustion, pain, etc., in the lumbar and sacral regions of the spine in cases of irritative disease of the pelvic viscera. Then, again, no part of the alimentary tract is so often the seat of important irritative disease as that which lies in what may be called the gastric zone. This includes the stomach, more especially its mucous membrane, the liver, and the duodenum. Irritative disease, especially chronic subacute affections of these organs, involve their nerves, and these become the channels of a disturbing influence, which sooner or later exhausts and irritates the corresponding horizons of the spinal marrow. These horizons for the stomach, etc., lie between the third and the eighth dorsal vertebræ, or in the interscapular region. Spinal irritation situated within these limits, I have found, points, with almost unerring certainty, to irritative disease in the gastric zone.

The spinal horizons which appear, clinically speaking, to stand in connection with the small intestine, are included between the eighth and eleventh dorsal vertebræ. The horizon which, in like manner, I have found to correspond to the colon, especially its descending portion and its sigmoid flexure, lies between the eleventh dorsal and the second or third lumbar vertebræ, whereas the spinal region, tenderness of which appears to stand in connection with disease within the pelvic zone, extends from the lower dorsal down to the limits of the lumbar part of the spine or even beyond, while disease of the rectum, especially about the anus, and of the neck of the womb, finds its tender zone from the lower lumbar region down to the coccyx. Chronic

irritative affections of the lungs and the pleura give rise, if at all, to tenderness from about the middle dorsal up to the altitude on a level with the middle cervical region.

Chronic painful affections of the pharyngeal zone, including subacute nasal and pharyngeal catarrh, give rise in some cases to tenderness in the region extending from the suboccipital to the middle cervical region. These are understood to be approximations to the truth, as determined from a clinical standpoint.

Such are the two principal groups into which cases of true spinal irritation may be divided, according to my observation,—all cases including, as already described, a lesion of nutrition with certain symptoms to which that lesion gives rise, chief among which are more or less persistent fatigue, pain, and hyperalgesia in the nerves of the affected zone, especially those that run the shortest course from the integument over the affected region of the spine to the spinal cord. If the remarks made as to the nature and conditions of spinal irritation are correct, they point out plainly the general line along which treatment, if successful, must be conducted.

Granting the existence of the nutritive lesion insisted upon, it is plain that the first and most imperative condition to be complied with is that of rest. If the spinal irritation can be traced either to over-use or to over-excitation, a first duty is to remove the cause by stopping the action, or by appropriate treatment of the irritative disease, which may be a morbid feature in spinal irritation, whether it be in the alimentary canal, or the genito-urinary tract, or elsewhere. The recognition of spinal irritation as having the nature and causes already specified, directs the observer intelligently to its causes. But, as already said, the first condition to be complied with is rest. In this way waste in the play of nutritive activities is diminished.

The second condition to be complied with is to give, by every means at command, a full supply of materials for a fresh impulse to nerve nutrition. Under this head is included, not only good feeding, but whatever is adapted to such cases in general, and to these cases in particular, in the way of tonics.

As respects irritative visceral disease, it need be scarcely said, after its existence and nature have been determined, that it calls for careful, effectual treatment. Gastric and gastro-duodenal catarrhs, irritative disease of the mucous membrane of the small intestine lower down, or of particular segments of the colon, the irritation produced by habitual constipation and consequent colic impactions, persistent disease of the rectum, or of the uterus, vagina, bladder, or other parts of the genito-urinary tract,—all should receive special attention. In this paper it is impracticable for me to describe the treatment adapted to each case. But it may be laid down as a law in the treatment of such cases, that unless the particular mode or kind of over-action or morbid excitation is not determined and rationally met, many of the cases are likely to remain, as they have always been, among the opprobria of practical medicine.

There are two special points in the treatment of this class of cases to which I desire to direct attention. The first of these relates to the persistent use of small doses of opium, either the watery extract, or the muriate or bimeconate of morphia, antagonized in either case by correspondingly small doses of a reliable preparation of belladonna, usually associated with the tonics given. The opium or preparations of its salts indicated are usually given by me without the knowledge of the patient, though not always so, and uniformly in small doses. Of the watery extract of opium, the doses given range from the twelfth to the sixth of a grain at a dose, twice daily or oftener. Of the morphia, the

dose is from a thirtieth to a tenth, twice or thrice daily, in connection with other remedies, also antagonized by moderate doses of belladonna, in doses ranging from the eighth to the twentieth of a grain of the solid extract. I am persuaded that but few members of the profession can be fully aware of the very great benefit to be derived from the use of opium, as just indicated, in painful affections of the nervous system. If it is properly employed I am convinced there is no danger of forming an "opium habit." In a large experience in its use by the mouth, I have not yet seen a case of the "opium habit" produced in the use of opium as just indicated. While its use does not entirely banish pain, it blunts the edge and usually inspires the patient (where it agrees) with a feeling of positive comfort, and, in many instances, actually improves nutrition.

The second point in treatment consists in the use of electricity, especially the electrical wire brush, generally using it at the positive electrode, the negative pole being at one or both feet of the patient. In connection with the local use of electricity, beginning in a very mild manner I have employed it at each sitting in a more general manner, the descending spinal current from the nape of the neck downward to the feet. In some instances, in using the electrical metallic brush, I have reversed the poles, using a mild current, thoroughly pencilled by rather rapid movements of the brush, at first, and making the movements of the brush slower as the sitting advances, directing attention chiefly, though not exclusively, to the sensitive zones of the spine. These sittings have been not oftener than once a day, usually, when practicable, in the afternoon. Sometimes I have used the galvanic, at other times a fine induced current from the second coil of a good induction machine. Combined with the bodily and mental rest I have uniformly directed more or less thorough careful massage, according to the case.

Such is a simple statement of the views at which I have arrived in regard to the nature and general modes of treatment of spinal irritation. I do not for a moment claim for them the merit of novelty. But they are fruits, in no unimportant sense, of personal observation and experience.